

### Abstract

A method is provided to study gene function based on variations of the amino acids and the base sequences at specific positions on HLA genes which have polymorphisms and codon usage. Medical industry applications for the method are also provided. The amino acid position(s) of the polymorphic amino acid(s) in amino acid sequence(s), including at least one of DRB1\*gene, DQB1\*gene, and DPB1\*gene of HLA, is determined, the variation of the base sequences coding polymorphic positions of the amino acid and survival results with anticancer treatments after cancer resections, and survival results (prognosis, treatment effects) are analyzed, and the statistical relationship of the specific positions of the amino acids and the treatments is determined.

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